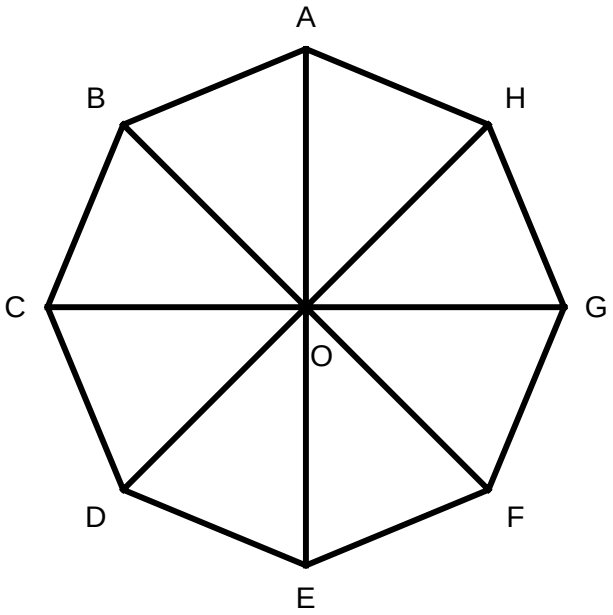
Worksheet 14.3: Rotations

The diagonals of regular octagon ABCDEFGH form eight congruent triangles. Complete each statement below.



1. A rotation of 45° about O maps B onto _____.

2. A rotation of -135° about O maps E onto _____.

3. Two rotations about O that map C onto A are _____ and

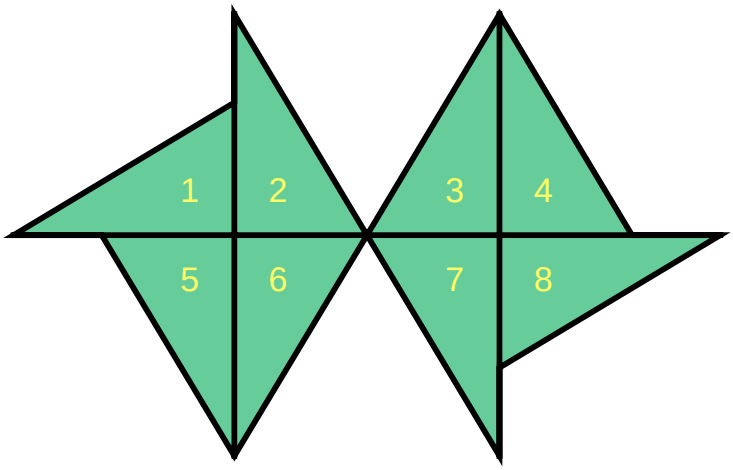
_____.

4. A rotation of 225° about O maps which point onto G?

5. A 135° rotation about F maps G onto _____.

6. A 225° rotation about D maps _____ onto E.

State whether the specified triangle is mapped onto the other triangle by a reflection, translation, rotation, or a half-turn.



7. $\Delta 1 \rightarrow \Delta 2$

8. $\Delta 3 \rightarrow \Delta 4$

9. $\Delta 5 \rightarrow \Delta 6$

10. $\Delta 5 \rightarrow \Delta 7$

11. $\Delta 5 \rightarrow \Delta 1$

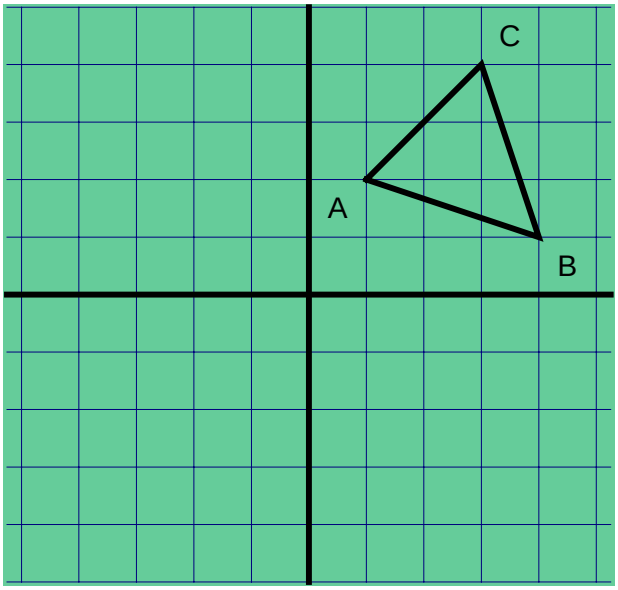
12. $\Delta 1 \rightarrow \Delta 8$

13. $\Delta 2 \rightarrow \Delta 3$

14. $\Delta 2 \rightarrow \Delta 4$

15. There is a glide reflection in the figure above that maps $\Delta 4$ to _____.

16. Is there another pair of triangles for which there is a glide reflection?



17. State the coordinates of points A, B, and C in the figure above.

A = _____ B = _____ C = _____

18. Rotate the figure 90° about the origin. State the coordinates of the images of each point.

A' = _____ B' = _____ C' = _____

19. Rotate ΔA'B'C' 90° about the origin. State the coordinates of the images of each point.

A" = _____ B" = _____ C" = _____

20. Rotate ΔA"B"C" 90° about the origin. State the coordinates of the images of each point.

A"' = _____ B"' = _____ C"' = _____

21. Do you see a pattern? State a hypothesis about the relationship between the coordinates of a point and the coordinates of its image under a 90° rotation about the origin. Test your hypothesis by predicting the coordinates of A"", B"", and C"" found by rotating ΔA"'B"'C"' 90° about the origin. You should get the same coordinates as the vertices of ΔABC.